

R E M A R K S

I. Introduction

In response to the pending final Office Action, Applicants have incorporated the features of claim 7 into independent claims 1 and 10 to further clarify the subject matter of the present disclosure. Claim 7 has been cancelled without prejudice. New claims 15 and 16 have been added. Support for new claims 15 and 16 may be found, for example, in Table 7 of the specification. The Title has been amended. Applicants have taken care to avoid the introduction of new matter.

A Request for Continued Examination (RCE) is being filed concurrently with this Amendment.

Applicants respectfully submit that all pending claims as currently amended are patentable over the cited prior art.

II. The Patentability Of Claims 1-14

Claims 1-6, 9, 11 and 13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yonemura (JP 2003-346888) in view of Ohba et al. (USP No. 5,989,750) and Haruno et al. (JP 08-236101); claim 7 as being unpatentable over Yonemura, Ohba et al., and Haruno et al. and further in view of Doi et al. (USP No. 4,210,709); and claims 8, 10, 12 and 14 as being unpatentable over Yonemura, Ohba et al., and Haruno et al. and further in view of Carlisle (USP No. 3,227,583). Applicants traverse the above rejections for at least the following reasons.

With regard to the present disclosure, independent claims 1 and 10 recite, in part, a lead storage battery including: a negative electrode active material layer which includes Sb, and a separator which includes silica and contains 5.0 to 30 % by mass of an oil.

One feature of the present disclosure is that the separator of the lead storage battery includes 5.0 to 30 % by mass of an oil. By including the oil in the separator, Sb contained in the negative electrode active material layer and dissolved into the electrolyte is captured to prevent corrosion of the negative electrode grid tab due to deposition of Sb. Moreover, oxidation resistance of the separator itself improves. When the oil content in the separator is below 5 % by mass, the Sb capturing effect of the oil becomes insufficient. On the other hand, when the oil content in the separator is greater than 30 % by mass, ion permeability of the separator is reduced, and an internal pressure of the battery increases.

In the battery, the electrolyte level is set so that the positive electrode strap 6 and the like are immersed in the electrolyte. As such, the electrolyte level should be above the electrode plate pack 11 (see, Fig. 1 of the drawings). Accordingly, since oil flowing out of the separator moves to a liquid surface of the electrolyte positioned on an upper side than the electrode plate pack, and since the oil does not exist between the positive 2 and negative 3 electrode plates and electrolyte, then even if the oil flows out from the separator during use, the oil would not adversely affect the electrodes.

It is admitted in the Office Action that Yonemura, Ohba et al. and Haruno et al. are all silent as to a separator containing oil (see, May 23, 2011 Office Action, page 7, lines 1-2). It is asserted that Doi discloses an oil used to form a film separator. Applicants respectfully disagree.

It is true that Doi discloses the use of oil in the process of forming a microporous film (see, col. 8, lines 47-55). However, the finished separator of Doi does not contain oil. As is recited in this same passage, polyolefin, inorganic filler and organic liquid (which can be oil) is blended, and “the resulting blend is subjected to molding to form a film, followed by *extraction of the organic liquid* to form a filmy matrix having therein void spaces.” Thus, to form the separator of Doi, the oil must be removed from the film to form the voids. This is evident from the passage in col. 7, lines 66-67 which states “[t]he microporous film of the present invention comprises a matrix comprising a polyolefin and an inorganic filler”. As is clear, no oil is present in the separator of Doi. As such, the combination of Yonemura, Ohba et al., Haruno et al., and Doi fails to disclose a separator which includes silica and contains 5.0 to 30 % by mass of an oil.

Moreover, Doi does not disclose regulating the electrolyte level in the battery. As such, the storage battery of Doi cannot be used with the oil contained in the separator, because the oil will have an adverse effect on the electrodes as explained above.

Furthermore, Carlisle has not been relied upon to remedy this deficiency. Carlisle appears silent with regard to the presence of oil in the separator. Carlisle teaches that the separators 13 are of conventional design and may be of wood, glass, plastic, asbestos, rubber or any other suitable non-conductor (see, col. 6, lines 7-15). As such, Carlisle also fails to disclose a separator containing 5 to 30% by mass of oil.

In view of the above, it is clear that the combination Yonemura, Ohba et al., Haruno et al., Carlisle and Doi fails to teach or suggest a lead storage battery including a negative electrode active material layer which includes Sb, and a separator which includes silica and contains 5.0 to 30 % by mass of an oil. Therefore, Applicants submit that Yonemura, Ohba et al., Haruno et al.,

Carlisle and Doi do not render amended independent claims 1 and 10 of the present disclosure obvious.

III. All Dependent Claims Are Allowable Because The Independent Claim From Which They Depend Is Allowable

Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, *Hartness International Inc. v. Simplimatic Engineering Co.*, 819 F.2d at 1100, 1108 (Fed. Cir. 1987). Accordingly, as claims 1 and 10 are patentable for the reasons set forth above, it is respectfully submitted that all pending dependent claims are also in condition for allowance.

Moreover, new claims 15 and 16 are dependent upon claims 1 and 10, respectively. As claims 1 and 10 are allowable and patentable over the cited prior art as indicated above, Applicants submit that new claims 15 and 16 are also allowable over the cited prior art for at least the same reasons, an indication of which is respectfully solicited.

IV. Rejection Of Claims 1-4, 6 and 10 Under Nonstatutory Double Patenting Doctrine

Claims 1-4, 6 and 10 stand rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-4 and 8 of copending U.S. Application No. 10/587,186 to Sugie in view of Haruno et al. (JP 08-236101) and Carlisle (USP No. 3,227,583); and claims 1 and 10 stand rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of copending U.S. Application No. 10/587,187 to Sugie in view of Ohba et al. (USP No. 5,989,750), Haruno and Carlisle.

Application No.: 10/585,078

With regard to Application No. 10/587,186, since the rejection is provisional, Applicants respectfully request that the rejection be withdrawn until such time as claims in either application have been indicated to be allowable. As claims are often amended during prosecution, it is possible that the claims determined to be allowable may be patentably distinct from one another. According to PAIR, as of today August 23, 2011, the claims of Application No. 10/587,186 have yet to be allowed. As such, Applicants respectfully request that the double patenting rejection of claims 1-4, 6 and 10 be withdrawn.

With regard to Application No. 10/587,187, now US Patent No. 7,597,998, Applicants note that Sugie fails to discuss a separator containing oil. Further, as indicated above, none of Yonemura, Ohba et al., Haruno et al., Carlisle and Doi disclose a separator containing oil as well. Accordingly, Applicants submit that the obviousness-type double patenting of claims 1 and 10 over claim 1 of Sugie in view of Ohba et al., Haruno et al. and Carlisle is improper. As such, Applicants respectfully request that the double patenting rejection of claims 1 and 10 be withdrawn.

V. Conclusion

Having responded to all open issues set forth in the Office Action, it is respectfully submitted that all claims are in condition for allowance.

Application No.: 10/585,078

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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